Nodes

Completed Technology Project (2014 - 2016)

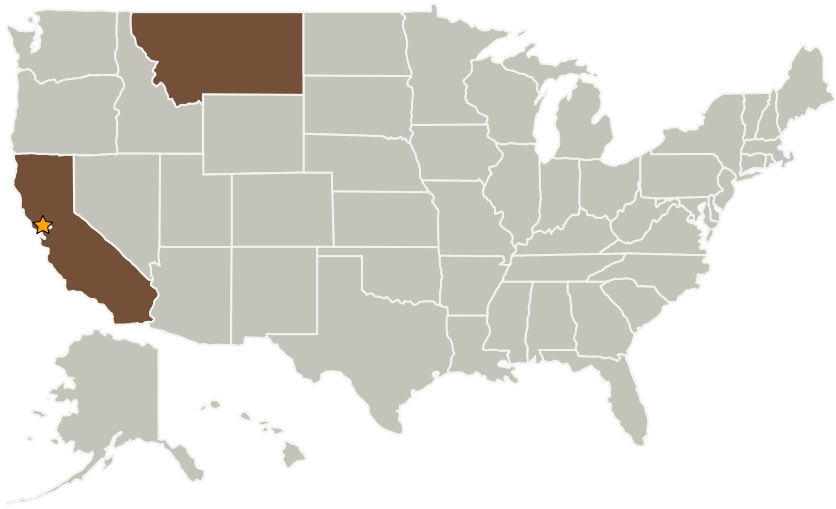
Project Introduction

The Nodes mission was a follow on to the EDSN swarm mission that was lost in a launch vehicle failure. Nodes explored issues associated with the command and control of multi-spacecraft swarms by: relaying ground commands through one satellite to the second satellite, collecting and relaying science data between satellites, and autonomously determining which of the two satellites was best situated to control the space network and relay data to the ground.

Anticipated Benefits

Swarm technologies have the potential to provide flexible data correlation and distribution, system redundancy, simplification of satellite operations and the enabling of new multi- satellite science investigations through distributed architectures, sensor webs and disaggregated systems. These architectures can provide enhanced scientific data collection at reduced cost for industry, university researchers, NASA and other government agencies.

Primary U.S. Work Locations and Key Partners



Nodes

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Spacecraft Technology

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Montana State University - Bozeman	Supporting Organization	Academia	Bozeman, Montana
Santa Clara University	Supporting Organization	Academia	Santa Clara, California

Primary U.S. Work Locations	
California	Montana

Project Transitions

January 2014: Project Start

June 2016: Closed out

Closeout Summary: The Nodes mission launched and deployed two 1.5U Cube Sats from ISS into low-Earth orbit on 05/16/2016. Nodes successfully demonstr ated multipoint data collection and inter-satellite networking including: relaying ground commands through one satellite to the second satellite, cross linking of d ata between the two satellites, and autonomous determination of which of the t wo satellites was best situated to control the space network and relay data to th e ground.

Links

Nodes Project Page
(https://www.nasa.gov/feature/nasa-small-satellites-to-demonstrate-swarm-communications-and-autonomy)

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

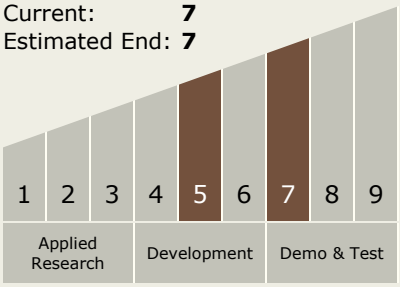
Program Director:
Christopher E Baker

Program Manager:
Roger Hunter

Principal Investigator:
John Hanson

Technology Maturity (TRL)

Start: **5**
Current: **7**
Estimated End: **7**



Target Destination

Earth